Before the FEDERAL COMMUNICATIONS COMMISSION Washington, DC 20554

In the Matter of)		
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Globalstar, Inc. Petition for Rulemaking)	RM	
to Reform the Commission's Regulatory)		
Framework for Terrestrial Use of the)		
Big LEO MSS Band)		FILED/ACCEPTED
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PETITION FOR RULEMAKING OF GLOBALSTAR, INC.

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Executive Summary

In this Petition for Rulemaking, Globalstar, Inc. ("Globalstar") proposes pro-investment, pro-consumer reforms that will enable Globalstar to make the kind of innovative, efficient use of spectrum that the Commission seeks. By initiating a rulemaking proceeding, adopting the regulatory reforms proposed herein, and permitting flexible terrestrial use of Big LEO spectrum, the Federal Communications Commission ("Commission") will generate significant and immediate benefits for American consumers.

Globalstar's Commitment to MSS. Globalstar is licensed to provide mobile satellite service ("MSS") in the Big LEO band at 1610-1618.725 MHz (the "Lower Big LEO band" for uplink operations) and 2483.5-2500 MHz (the "Upper Big LEO band" for downlink operations). As a leading provider of MSS, Globalstar is deeply committed to the future of its satellite business. Since its inception, Globalstar has invested in excess of \$5 billion in its global MSS network, including more than \$1 billion in its second-generation MSS constellation, which Globalstar expects to be fully launched by early 2013. With over 550,000 subscribers worldwide, including approximately 100,000 duplex (voice) customers, Globalstar's MSS offerings have provided extraordinary public safety benefits to commercial and government customers and consumers around the world.

Globalstar has never wavered in meeting its core MSS commitments to public safety, even when faced with the deterioration of its first-generation constellation. Globalstar's family of SPOT products is now being used by subscribers to initiate on average more than one rescue per day, often life saving, with over 2,100 total rescues achieved since the SPOT's introduction in 2007. Now, with Globalstar's second-generation constellation nearing full deployment, first responders and other emergency personnel in the regions hardest hit by Hurricane Sandy are

turning to Globalstar's duplex services for critical communications when all existing terrestrial systems fail. Globalstar is working hard to develop an array of new and innovative MSS offerings for the public safety community and the rest of its growing customer base.

Yet, Globalstar wants to and should do more. In order to maximize public benefits, Globalstar must receive greater flexibility for terrestrial use of its Big LEO spectrum. With this Petition, Globalstar proposes both a long-term plan to utilize its full Big LEO spectrum allocation for a Frequency Division Duplex ("FDD") LTE-based mobile broadband network, as well as a completely separate near-term plan to utilize only the Upper Big LEO band at 2483.5-2495 MHz for an innovative terrestrial low-power service ("TLPS") offering. In the long run, by deploying an optimal mix of LTE and TLPS facilities in the Big LEO band, Globalstar will achieve a full and intensive terrestrial utilization of its spectrum.

spectrum in most locations will ultimately be for FDD LTE operations. With this planned FDD LTE build-out, Globalstar is not proposing any terrestrial use of its spectrum that would compromise the accuracy or dependability of Global Positioning System ("GPS") services. Globalstar's most successful products and services operate in the Lower Big LEO band and have built-in GPS chipsets for location awareness. As such, they depend entirely upon properly functioning GPS receivers and coexist in practice with GPS every day. Moreover, Globalstar's proposed FDD LTE terrestrial network architecture will require only low-power uplink transmissions from mobile handsets in its Lower Big LEO spectrum. Nevertheless, before FDD LTE can be deployed in the band, the Commission should address any concerns regarding the coexistence of GPS and commercial wireless operations within the Lower Big LEO band. With this Petition, Globalstar proposes an open and transparent rulemaking proceeding in which all

interested parties are invited to participate and resolve any issues that may be identified regarding Globalstar's terrestrial FDD LTE plans.

Terrestrial Low-Power Service. While the Commission and interested parties work through any technical issues described above, the Commission has an extraordinary opportunity to leverage Globalstar's spectrum location in the 2.4 GHz band, the public's prior investment in devices, and existing IEEE 802.11 technology to advance the rapid deployment of an innovative, pro-consumer TLPS. Applying a unique, hybrid spectrum approach, Globalstar will provide this low-power broadband service over 22 megahertz of spectrum that includes both Globalstar's exclusive terrestrial use spectrum at 2483.5-2495 MHz and adjacent unlicensed industrial, scientific and medical ("ISM") spectrum at 2473-2483.5 MHz. TLPS operations on this 2473-2495 MHz band segment are consistent with the 802.11 channelization scheme, which includes fourteen overlapping 22 megahertz channels between 2401 MHz and 2495 MHz.

If the Commission implements the necessary regulatory reforms to enable this hybrid approach, it will add 22 megahertz to the nation's wireless broadband spectrum inventory. In addition, this spectrum will be put quickly to use as American consumers utilize their current 802.11-enabled devices to receive Globalstar-managed TLPS, which will help alleviate the increasing congestion that is impeding use of existing 802.11 ISM channels in dense metropolitan areas. As Chairman Genachowski recently pointed out, Wi-Fi usage at high-traffic "hotspots" is proving to be an increasingly frustrating experience. With TLPS providing additional 802.11-based capacity, Globalstar will be able to provide consumers with improved wireless broadband service, including faster data speeds and better Voice over Internet Protocol ("VoIP") functionality. In addition, TLPS deployments will deliver meaningful public safety benefits. During disasters such as Hurricane Sandy, still-operating 802.11-based hotspots can

provide broadband and voice communications to citizens in affected areas who otherwise lack access to communications services. The addition of TLPS facilities will augment this important post-disaster resource. These TLPS-based public interest benefits will be long lasting, since TLPS deployments will likely remain the most efficient, economically viable terrestrial application over the long term in many geographic areas, including areas with lower population densities.

Commission Reform in the Upper Big LEO Band. For these near-term and long-term terrestrial services to become a reality, the Commission must reform its Big LEO rules by taking the following actions:

- Add co-primary Fixed and Mobile allocations to the 2483.5-2495 MHz band (or "AWS-5" band);
- Modify Globalstar's Big LEO license to include AWS-5 terrestrial authority, with common control of MSS and AWS-5 operations enabling intensive coordination to minimize interference to Globalstar's MSS offerings;
- Eliminate existing ancillary terrestrial component ("ATC") gating requirements, including the substantial satellite service requirement and the dual-mode equipment requirement;
- Adopt flexible technical and operational rules similar to those applied in other terrestrial wireless bands, thus allowing the use of various technologies in this band;
- Grant one national terrestrial authorization, rather than numerous geographic area licenses:
- Permit spectrum manager leases covering any volume of Big LEO spectrum and any geographic territory within the nationwide AWS-5 license area;
- Adopt performance requirements similar to those adopted in analogous commercial wireless bands that only become effective once the Commission has granted FDD LTE uplink authority in the Lower Big LEO band.

To accommodate the spectral mask of Globalstar's TLPS transmissions, the Commission should adopt an out-of-band emissions ("OOBE") limit similar to the one recently proposed for the adjacent 2.5 GHz band. To protect the integrity of the AWS-5 band, Globalstar will provide TLPS only to authenticated users and devices, and it will utilize available network management and security technologies to prevent unauthorized use of this spectrum.

If the Commission adopts the necessary reforms in the Upper Big LEO band, Globalstar commits to deploying thousands of free TLPS access points in the nation's public and non-profit schools, community colleges, and hospitals. These free deployments will bring all of the TLPS-related benefits to these critical environments. In addition, if the Commission takes these regulatory steps, Globalstar commits to provide its mobile satellite service *free of charge* to Globalstar subscribers within any federally declared "disaster area" following a natural or manmade disaster. With this offering, Globalstar customers will have the peace of mind of knowing that their satellite service is free during those times when they need the service the most.

Second Parallel Proceeding on Lower Big LEO band. When the Commission initiates a rulemaking proceeding on AWS-5 and TLPS, it should also begin a second, parallel proceeding on terrestrial operations in the Lower Big LEO band at 1610-1617.775 MHz. Once the Commission concludes this open, transparent process and resolves parties' concerns regarding the coexistence of Big LEO mobile handsets and GPS systems, the Commission should integrate the 1610-1617.775 MHz band into the AWS-5 block and extend its fundamental terrestrial-use reforms to this Lower Big LEO band spectrum. In conjunction with future terrestrial partners, Globalstar will then move forward expeditiously with the deployment of Big LEO FDD LTE systems. With the application of this globally emerging mobile technology, Globalstar's nearly 20 megahertz of terrestrial use spectrum will help meet the nation's exploding spectrum demand and improve the quality of wireless service for American consumers.

Thus, Globalstar urges the Commission to undertake the proposed Big LEO reforms expeditiously to generate the spectrum efficiency and other public interest benefits that it values so highly. By establishing a flexible AWS-5 regulatory framework and permitting the roll-out of TLPS, the Commission will add *22 megahertz* of additional spectrum for wireless broadband

operations to the nation's spectrum inventory. This additional use of Globalstar's spectrum will ensure the economic viability of its global Big LEO MSS system and all of the public interest benefits generated by that network. With reinvigorated MSS operations and a robust mobile broadband build-out in the MSS bands, Globalstar will be able to provide a full range of satellite and terrestrial services to consumers, public safety users, government and business customers, and rural and remote communities throughout the United States.

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ATT	ACHMENTS:		

Appendix A – Proposed Rules

 $Appendix \ B-Technical \ Analysis$

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PETITION FOR RULEMAKING OF GLOBALSTAR, INC.

Pursuant to Section 1.401 of the Commission's rules, ¹ Globalstar, Inc. ("Globalstar") hereby petitions the Federal Communications Commission ("Commission") to initiate a rulemaking on terrestrial operations in the Big LEO mobile satellite service ("MSS") band, in order to encourage wireless investment and innovation, unleash a vital new supply of broadband spectrum, and deliver extraordinary benefits to American consumers. To realize these goals, Globalstar urges the Commission to undertake fundamental reform of its regulatory framework for terrestrial operations in the Big LEO band and make the necessary amendments to Parts 1, 2, 25, and 27 of its rules.

I. Introduction and Summary

The Commission should expeditiously initiate a rulemaking on terrestrial use of the Big LEO band in order to promote wireless broadband development, make more efficient use of available spectrum, and generate enormous benefits for consumers in the United States. In its March 2012 rulemaking proposal on terrestrial use of the 2 GHz MSS band ("2 GHz NPRM"), the Commission stated that it would subsequently hold a separate proceeding on terrestrial

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¹ 47 C.F.R. § 1.401.

operations in the Big LEO band.² The Commission should move forward now with proinvestment, pro-consumer reforms in the Big LEO band, to replace its decade-old ancillary terrestrial component ("ATC") rules.³

Globalstar is licensed to provide mobile satellite service ("MSS") in the Big LEO band at 1610-1618.725 MHz (the "Lower Big LEO band" for uplink operations) and 2483.5-2500 MHz (the "Upper Big LEO band" for downlink operations). As a leading provider of MSS, Globalstar is deeply committed to the future of its satellite business. Since its inception, Globalstar has invested in excess of \$5 billion in its global MSS network, including more than \$1 billion in its second-generation MSS constellation, which Globalstar expects to be fully launched by early 2013. With over 550,000 subscribers worldwide, including approximately 100,000 duplex (voice) customers, Globalstar's MSS offerings have provided extraordinary public safety benefits to commercial and government customers and consumers around the world.

Globalstar has never wavered in meeting its core MSS commitments to public safety, even when faced with the deterioration of its first-generation constellation. Globalstar's family of SPOT products is now being used by subscribers to initiate on average more than one rescue per day, often life saving, with over 2,100 total rescues achieved since the SPOT's introduction in 2007. Now, with Globalstar's second-generation constellation nearing full deployment, first responders and other emergency personnel in the regions hardest hit by Hurricane Sandy are turning to Globalstar's duplex services for critical communications when all existing terrestrial

² Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands, Notice of Proposed Rulemaking and Notice of Inquiry, 27 FCC Rcd 3561 (2012) ("2 GHz NPRM").

³ See Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands, Report and Order and Notice of Proposed Rulemaking, 18 FCC Rcd 1962 (2003) ("ATC Order").

systems fail. Globalstar is working hard to develop an array of new and innovative MSS offerings for the public safety community and the rest of its growing customer base.

Yet, Globalstar wants to and should do more. In order to maximize public benefits, Globalstar must receive greater flexibility for terrestrial use of its Big LEO spectrum. With this Petition, Globalstar proposes both a long-term plan to utilize its full Big LEO spectrum allocation for a Frequency Division Duplex ("FDD") LTE-based mobile broadband network, as well as a completely separate near-term plan to utilize only the Upper Big LEO band at 2483.5-2495 MHz for an innovative terrestrial low-power service ("TLPS") offering. In the long run, by deploying an optimal mix of LTE and TLPS facilities in the Big LEO band, Globalstar will achieve a full and intensive terrestrial utilization of its spectrum.

Ultimately, the highest and best terrestrial use of Big LEO spectrum in most locations will involve the deployment of FDD LTE systems, with end user devices operating in the Lower Big LEO band and base stations in the Upper Big LEO band. With this planned FDD LTE build-out, Globalstar is not proposing any terrestrial use of its spectrum that would compromise the accuracy or dependability of Global Positioning System ("GPS") services. Globalstar's most successful products and services operate in the Lower Big LEO band and have built-in GPS chipsets for location awareness. As such, they depend entirely upon properly functioning GPS receivers and coexist in practice with GPS every day. Moreover, Globalstar's proposed FDD LTE terrestrial network architecture will require only low-power uplink transmissions from mobile handsets in its Lower Big LEO spectrum. Nevertheless, before FDD LTE can be deployed in the band, the Commission should address any concerns regarding the coexistence of GPS and commercial wireless operations within the Lower Big LEO band. With this Petition, Globalstar proposes an open and transparent rulemaking proceeding in which all interested

parties are invited to participate and resolve any issues that may be identified regarding Globalstar's terrestrial FDD LTE plans.

While the Commission and interested parties work through any technical issues described above, the Commission has an extraordinary opportunity to advance the rapid deployment of an innovative, pro-consumer terrestrial low-power service ("TLPS"). Acting now, the Commission can leverage Globalstar's spectrum location at 2.4 GHz, the public's prior investment in devices, and existing IEEE 802.11 technology to generate enormous benefits for American consumers. Applying a unique, hybrid spectrum approach, Globalstar will provide this low-power broadband service over 22 megahertz of spectrum that includes both Globalstar's exclusive terrestrial use spectrum at 2483.5-2495 MHz and adjacent unlicensed industrial, scientific and medical ("ISM") spectrum at 2473-2483.5 MHz. TLPS operations on this 2473-2495 MHz band segment are consistent with the 802.11 channelization scheme, which includes fourteen overlapping 22 megahertz channels between 2401 MHz and 2495 MHz.

If the Commission implements the necessary regulatory reforms to enable this hybrid approach, it will add 22 megahertz to the nation's wireless broadband spectrum inventory. In addition, this spectrum will be put quickly to use as American consumers utilize their existing 802.11-enabled devices to receive TLPS. This additional 802.11-based capacity will help alleviate the congestion – and frustration – currently experienced by many Wi-Fi users at high-traffic "hotspots" in dense metropolitan areas. TLPS will also deliver meaningful public safety benefits, since still-operating 802.11-based hotspots can provide much-needed broadband and voice communications to citizens in areas affected by hurricanes and other disasters. These TLPS-based public interest benefits will be long lasting, since TLPS deployments will likely

remain the most efficient, economically viable terrestrial application over the long term in many geographic areas, including areas with lower population densities.

To permit the eventual deployment of FDD LTE in the Big LEO band and enable the near-term roll-out of TLPS, the Commission should add co-primary Fixed and Mobile allocations to the 2483.5-2495 MHz band and make other necessary changes to Parts 1, 2, 25, and 27 of its rules. In addition to the new allocations, the Commission should adopt flexible terrestrial-use rules in the Upper Big LEO band that are similar to those proposed by the Commission in the 2 GHz NPRM, albeit with certain distinctive elements. Given the similarity of Globalstar's proposed regulatory framework to the Commission's proposed AWS-4 approach at 2 GHz (as well as rules in other AWS bands), Globalstar believes that the Commission should refer to the terrestrial wireless spectrum at 2483.5-2495 MHz as the "AWS-5" band. As described *infra*, the Commission's pro-consumer, pro-investment AWS-5 framework should:

- Modify Globalstar's Big LEO license to include AWS-5 terrestrial authority, with common control of MSS and AWS-5 operations enabling intensive coordination to minimize interference to Globalstar's MSS offerings;
- Eliminate existing ATC gating requirements, including the substantial satellite service requirement and the dual-mode equipment requirement;
- Adopt flexible technical and operational rules similar to those applied in other terrestrial wireless bands, thus allowing the use of various technologies in this band
- Grant one national terrestrial authorization, rather than numerous geographic area licenses;
- Permit spectrum manager leases covering any volume of Big LEO spectrum and any geographic territory within the nationwide AWS-5 license area;
- Adopt performance requirements similar to those adopted in analogous commercial wireless bands that only become effective once the Commission has granted FDD LTE uplink authority in the Lower Big LEO band.

To accommodate the spectral mask of TLPS transmissions, the Commission should adopt an out-of-band emissions ("OOBE") limit for low-power operations in the AWS-5 band that is similar to what adjacent-band licensee Clearwire Corporation has proposed for terrestrial wireless operations in the 2.5 GHz Broadband Radio Service ("BRS")/Educational Broadband

Service ("EBS") band. To protect the integrity of the AWS-5 band, Globalstar will provide TLPS only to authenticated users and devices, and it will utilize available network management and security technologies to prevent unauthorized use of this spectrum.

If the Commission adopts the necessary reforms in the Big LEO band, Globalstar commits to deploying thousands of free TLPS access points in the nation's public and non-profit schools, community colleges, and hospitals. These free deployments will bring all of the TLPS-related benefits to these critical environments. In addition, if the Commission takes these regulatory steps, Globalstar commits to provide its mobile satellite service *free of charge* to Globalstar subscribers within any federally declared "disaster area" following natural and manmade disasters. With this offering, Globalstar customers will have the peace of mind of knowing that their satellite service is free during those times when they need the service the most.

At the same time that the Commission initiates a rulemaking proceeding on the AWS-5 band and the provision of TLPS, the Commission should begin a second, parallel proceeding on terrestrial operations in the Lower Big LEO band at 1610-1617.775 MHz. In that proceeding, the Commission should establish an open, transparent process for considering parties' remaining concerns regarding the coexistence of GPS systems and commercial mobile handsets in the Lower Big LEO band. Once the Commission resolves these technical issues, it should integrate the 1610-1617.775 MHz band into the AWS-5 block and extend its fundamental terrestrial-use reforms to this Lower Big LEO band spectrum. Globalstar will then move forward expeditiously with the deployment of Big LEO FDD LTE systems. Utilizing this globally emerging technology, Globalstar's nearly 20 megahertz of terrestrial use spectrum will help meet the nation's exploding spectrum demand and improve the quality of wireless service for American consumers.

By undertaking these Big LEO reforms and facilitating the delivery of these new services, the Commission will generate critical public interest benefits for American consumers and the U.S. economy. By establishing a flexible AWS-5 regulatory framework and allowing Globalstar to provide TLPS, the Commission will promote just the kind of innovative, efficient use of spectrum that the Chairman called for in his recent address on spectrum issues. This roll-out of Globalstar-managed TLPS will add *22 megahertz* of additional spectrum to the nation's wireless broadband spectrum inventory, while ensuring the economic viability of its global Big LEO MSS system and all of the public interest benefits generated by that network. With reinvigorated MSS operations and a robust mobile broadband build-out in the MSS bands, Globalstar will be able to provide a full range of satellite and terrestrial services to consumers, public safety users, government and business customers, and rural and remote communities throughout the United States.

II. Globalstar's Commitment to Mobile Satellite Service

Existing MSS operations. Globalstar is a leading provider of mobile satellite voice and data services around the world. In 1995, the Commission authorized Globalstar to construct, launch, and operate a "Big LEO" MSS system.⁵ Globalstar is licensed for uplink transmissions

See Winning the Global Bandwidth Race: Opportunities and Challenges for Mobile Broadband, Prepared Remarks of FCC Chairman Julius Genachowski, University of Pennsylvania – Wharton, Philadelphia, PA, at 3 (Oct. 4, 2012) ("Genachowski Spectrum Speech"), available at: http://transition.fcc.gov/Daily_Releases/Daily_Business/2012/db1005/DOC-316661A1.pdf.

Application of Loral/Qualcomm Partnership, L.P. For Authority to Construct, Launch, and Operate Globalstar, a Low Earth Orbit Satellite System to Provide Mobile Satellite Services in the 1610-1626.5 MHz/2483.5-2500 MHz Bands, Order and Authorization, 10 FCC Rcd 2333 (IB 1995); see also Spectrum and Service Rules for Ancillary Terrestrial Components in the 1.6/2.4 GHz Big LEO Bands; Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands, Second Order on Reconsideration, Second Report and Order, and Notice of Proposed Rulemaking, 22 FCC Rcd 19733, ¶¶ 8, 18-20 (2007).

(mobile earth stations to satellites) in the Lower Big LEO band at 1610-1618.725 MHz, and for downlink transmissions (satellites to mobile earth stations) in the Upper Big LEO band at 2483.5-2500 MHz.⁶ Having invested over \$5 billion to develop its global non-geostationary ("NGSO") MSS network, Globalstar today uses its global NGSO MSS constellation and 24 ground stations on six continents to provide cutting-edge MSS offerings to an expanding range of customers in the United States and around the world.

Globalstar initiated commercial service in 2000, and, based primarily on its duplex voice and data offerings, it enjoyed an approximately 30% annual growth in subscribership and revenues from 2003 to 2006. In early 2007, Globalstar's first-generation constellation suffered an unanticipated degradation of its S-band capability that temporarily precluded consistently reliable duplex voice and data services. In response, Globalstar refocused its energies on affordable consumer-based simplex products and services while simultaneously commencing the design, manufacture and launch of a second-generation constellation of satellites. As a result of this continuing growth, Globalstar currently provides affordable, high-quality MSS to more than 550,000 customers, including approximately 100,000 duplex (voice) customers, in over 120 countries around the world. Globalstar became profitable on an Adjusted EBITDA basis during

⁶ Iridium is authorized to share spectrum with Globalstar at 1617.775-1618.725 MHz.

In addition to individual consumers, Globalstar's customers include entities in government, the military, emergency preparedness, transportation, heavy construction, oil and gas, mining, forestry, and commercial fishing. For government and business customers, Globalstar's data solutions are ideal for asset and personal tracking, data monitoring, and supervisory control and data acquisition applications. Globalstar's services are available in all areas of the world, except in central and southern Africa, Southeast Asia, and the Indian subcontinent, areas in which Globalstar is working diligently to expand coverage.

the fourth quarter of 2011, and its financial results have improved during each subsequent quarter.⁸

Provision of mission-critical public safety services. Since initiating commercial MSS, Globalstar has been dedicated to providing mission-critical, emergency, and safety-of-life services to commercial, recreational, and government customers in remote, unserved, and underserved areas not reached by terrestrial deployments. In populated areas, Globalstar's MSS network provides critical back-up capabilities for public safety personnel during disasters when terrestrial facilities can be rendered unavailable. Public safety entities involved in relief efforts in the United States and around the world have relied on Globalstar's satellite services after earthquakes, hurricanes, and other disasters.

Globalstar's MSS network played a vital role during and after Hurricane Sandy's devastating effects in the Mid-Atlantic and Northeast regions of the United States, providing seamless communications in areas where terrestrial communications systems were damaged and rendered unavailable. For instance, New York Power Authority ("NYPA") employees at the Flynn Power Plant in Holtsville, New York relied exclusively on Globalstar MSS devices for their communications during the three-day period that terrestrial telephone and wireless systems were out of service. NYPA credited Globalstar as being "the only communications service functioning when all other wireless and landline systems went down." According to Frank Miller, the NYPA's Principal Communications Engineer, the Globalstar MSS equipment "performed as advertised. Once the plant made the initial call via Globalstar we all breathed a

Globalstar reported positive Adjusted EBITDA of \$2.9 million for the three months ended June 30, 2012 compared to negative Adjusted EBITDA of \$2.0 million for the three months ended June 30, 2011. This represented an increase of \$4.9 million over the second quarter of 2011. See Globalstar Press Release, Globalstar Announces Results for Second Quarter 2012 – Company Reports Continued Improvement in Adjusted EBITDA (Aug. 9, 2012), available at: http://www.globalstar.com/en/index.php?cid=7010&pressId=734.

little easier. The whole purpose of our Globalstar implementation over the years was for events just like this one. We are quite satisfied with the service we received in the time of this emergency."

During post-Sandy recovery efforts, the New York Police Department requested an additional fifty MSS handsets in response to continued spottiness in traditional cellular service. Other agencies and organizations in the storm-affected area that have utilized Globalstar's MSS products and services include the Federal Emergency Management Agency, Metropolitan Transit Authority, the New York State Department of Environmental Protection, the Port Authority, Con Edison, and numerous hospitals. Overall, during and after the storm, Globalstar experienced a greater than 50% increase in duplex traffic throughout New York, New Jersey, and Connecticut, with the highest concentration of calls occurring in New York City. Existing customers increased their MSS usage, and significant numbers of Globalstar phones were activated by new users during this period.

In recent years, Globalstar has also focused on the development of affordable, consumer-oriented devices and services with significant public safety benefits. Most notably, Globalstar's innovative, consumer-oriented "SPOT" family of MSS devices has played a critical role in the provision of emergency and safety-of-life services to individual consumers beyond terrestrial wireless reach. From any location in Globalstar's global MSS footprint, SPOT devices can transmit a user's GPS coordinates and status updates to any e-mail, handheld device, or smartphone address in the world. As of October 31, 2012, the family of SPOT devices has been used to achieve 2,113 emergency rescues, often life saving, in seventy-eight countries and at sea.

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In June 2012, the United States Forest Service purchased 6,000 SPOT Satellite GPS Messenger devices in order to enhance employee safety. *See* Globalstar Press Release, *U.S. Forest Service Purchases 6,000 SPOT Devices* (June 27, 2012), *available at*: http://www.globalstar.com/en/index.php?cid=7010&pressId=731.

During 2012 alone, SPOT products have been used to achieve 595 rescues, more than two per day.¹⁰

Potentially bolstering the nation's public safety communications, Globalstar's MSS network can be used in conjunction with an "Emergency Response Interoperable Communications" ("ERIC") system to provide critical communications capabilities in affected areas in the first crucial hours after a catastrophic incident. The ERIC system utilizes "drop-in" suitcases that can be deployed and utilized virtually immediately in areas where the existing terrestrial infrastructure has been damaged or disrupted and rendered temporarily unavailable. The ERIC system utilizes Globalstar's MSS network for seamless backhaul connectivity to public networks. While not yet authorized for operations in the United States, this system represents a highly cost-efficient means of providing flexible, robust, interoperable communications services to first responders and other public safety personnel. Globalstar looks forward to demonstrating this technology to the Commission and other agencies in the near future.

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SPOT users receiving assistance have included hikers, boaters, pilots, and remote workers, among others. Specific examples include a Boy Scout troop leader who was seriously injured by a falling horse in Mount Hood National Forest and airlifted to safety by the National Guard, a backcountry skier in Norway who was located and rescued after being trapped at high elevation during a severe winter storm, and an Arkansas photographer who was rescued from a steep ravine after falling 30 feet in the Ozark National Forest.

See Comments of Globalstar, Inc., PS Docket No. 11-15, at 6-8 (July 25, 2012) ("Globalstar ERIC Comments"); see also Comments of Globalstar Inc., NTIA, Docket No. 120928505-2505-01 (Nov. 1, 2012), available at: http://www.ntia.doc.gov/files/ntia/globalstar comments - firstnet noi 11.01.12.pdf>.

ERIC is capable of using spectrum that is licensed to existing commercial wireless, public safety, and private wireless operators, and the Commission is currently considering how and under what circumstances it might authorize the operation of ERIC and other similar aerial and ground-based emergency communications systems. *See Utilizing Rapidly Deployable Aerial Communications Architecture in Response to an Emergency*, Notice of Inquiry, 27 FCC Rcd 6402 (2012). Globalstar has made clear that these systems should operate only with the full approval and cooperation of the existing licensees whose bands will be utilized by these temporary operations. Globalstar ERIC Comments at 6-8. Globalstar looks forward to working

Second-generation MSS network. By mid-2013, Globalstar expects to become the first global LEO MSS voice and data company to complete the deployment of a state-of-the-art, second-generation MSS constellation that will enable anyone to stay connected beyond the reach of traditional terrestrial wireless networks. Pursuant to satellite construction and launch contracts with Thales Alenia Space and Arianespace, Globalstar has fully funded and almost entirely spent the more than \$1 billion cost of designing, manufacturing, delivering, launching, and insuring the first 24 satellites of its second-generation MSS constellation. Over the past two years, Globalstar has launched eighteen satellites of its second-generation MSS constellation, and all but one of these satellites had been placed into service as of the end of October 2012. With the completion of these three launches, current subscribers and new users are experiencing substantially improved voice and duplex data performance on Globalstar's network.

The fourth and final launch necessary to return Globalstar to full duplex service is currently scheduled for February 2013 at the Baikonur Cosmodrome in Kazakhstan. ¹⁶ Once

with commercial wireless carriers so that their customers can benefit from ERIC technology following disasters when existing terrestrial infrastructure is temporarily unavailable.

Globalstar's commitment to provide satellite services free of charge in federally declared disaster areas, described *infra* at 44, includes free satellite services provided in conjunction with the ERIC system.

Globalstar has also contracted with Thales AleniaSpace to upgrade its satellite operations and control center.

Thales Alenia Space recently delivered to Globalstar the software patch needed to remedy a momentum wheel issue affecting one second-generation satellite currently in orbit. Globalstar has completed the upload of the software to this satellite and expects to place it back into commercial service in the very near future. This software solution could be utilized by Globalstar's other second-generation satellites should they experience any similar issues with their momentum wheels, which is not however anticipated.

Globalstar has taken delivery of four of the final six satellites for the fourth launch, and these satellites are currently at the Cosmodrome being prepared for this launch. Globalstar expects to receive the final two satellites in December.

fully operational, Globalstar's second-generation MSS system will support highly reliable, crystal-clear CDMA-quality voice and data satellite services to the more than five billion consumers, public safety personnel, and other customers located within its global footprint. Globalstar's customers will enjoy the highest voice quality, fastest truly mobile data speeds, and the most affordable service in the MSS industry. Significant to the Commission's regulatory framework for MSS, Globalstar expects that by mid-2013, it will have the ability to meet the Commission's NGSO MSS coverage requirement (Section 25.143(b) of its rules) as applied to MSS voice and duplex data provided in both the Lower and Upper Big LEO bands.¹⁷

III. Globalstar's Business Plan for Terrestrial Operations in the Big LEO Band

A. Globalstar's Long-Term Terrestrial Goal: FDD LTE Operations in the Big LEO Band

In addition to the expansion of its consumer-based, safety-of-life MSS offerings, Globalstar's business plan includes the deployment of robust terrestrial wireless services throughout the Big LEO band. Certainly, Globalstar's licensed Big LEO MSS spectrum is uniquely positioned to support the simultaneous, robust build-out of mobile satellite and terrestrial mobile broadband services. Globalstar holds over 19 megahertz of terrestrial use spectrum in the Big LEO band, including almost eight megahertz of mobile uplink spectrum in the Lower Big LEO band at 1610-1617.775 MHz and 11.5 megahertz in the Upper Big LEO band at 2483.5-2495 MHz.¹⁸ While Globalstar currently cannot operate terrestrial systems because it does not meet the Commission's ATC "gating" criteria, it is looking to the future as the Commission moves to allow more flexible and efficient terrestrial use of the MSS bands.

¹⁷ See 47 C.F.R. § 25.143(b).

Spectrum and Service Rules for Ancillary Terrestrial Components in the 1.6/2.4 GHz Big LEO Bands; Globalstar Licensee LLC, Authority to Implement an Ancillary Terrestrial Component, Report and Order and Order Proposing Modification, 23 FCC Rcd 7210, ¶¶ 20-21, 30, 39 (2008).

Globalstar's Big LEO spectrum can support a variety of terrestrial mobile broadband applications and services. Globalstar's Upper Big LEO band spectrum at 2483.5-2495 MHz – which is already allocated internationally for Fixed and Mobile services – is a noise "refuge" in the 2.4 GHz band, with low-noise characteristics that significantly improve data capacity on a terrestrial wireless network. Meanwhile, Globalstar's Lower Big LEO band similarly enjoys unusually low interference and noise levels as well as highly favorable propagation characteristics, and, as a result, this band segment has among the highest data-carrying potential per hertz of any existing or anticipated commercial wireless band. Globalstar notes that the terrestrial bandwidth requirements in its Lower Big LEO band uplink spectrum will be substantially less than in its downlink frequencies at 2483.5-2495 MHz, since most bandwidth consumption occurs on the downlink side. Thus, the quantitative asymmetry between Globalstar's Lower and Upper Big LEO band terrestrial-use spectrum will not limit the usefulness of this spectrum for terrestrial operations, as these band segments can still be paired for FDD operations.

Under its long-term plan for its licensed Big LEO spectrum, Globalstar in conjunction with future terrestrial wireless partners will deploy FDD LTE terrestrial wireless facilities in the paired Lower and Upper Big LEO bands on a widespread basis. Globalstar's Lower Big LEO band spectrum at 1610-1617.775 MHz will be used for terrestrial mobile device uplink operations, while its Upper Big LEO band spectrum at 2483.5-2495 MHz will be used for LTE base station downlink operations. Globalstar believes that such FDD LTE operations constitute the highest and

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See Comments of Globalstar, Inc., ET Docket No. 10-142, at 7 (Sep. 15, 2010) ("Globalstar 2010 Comments").

best terrestrial use of the Big LEO band. Certainly, the development of LTE technology in the Big LEO band and elsewhere is a key component of America's broadband future.²⁰

Globalstar recognizes, of course, that the Commission must address the coexistence of commercial mobile handsets and GPS systems before there can be a robust terrestrial use of the Lower Big LEO band. For this reason, the deployment of an FDD LTE network in the Big LEO band represents a long-term goal rather than a short-term operational plan, and Globalstar requests that the Commission initiate a separate and parallel rulemaking devoted to terrestrial operations in the Lower Big LEO band at 1610-1617.775 MHz.

B. The Commission Has a Unique Opportunity to Fashion a Rapidly Deployable, Pro-Consumer Terrestrial Low-Power Service in the Upper Big LEO Band

Even while any GPS-related concerns regarding use of the Lower Big LEO band are being resolved, the Commission has an extraordinary opportunity to realize the rapid deployment of an innovative, pro-consumer terrestrial low-power service in the Upper Big LEO band. By taking the regulatory actions described in Section V of this Petition, the Commission can leverage Globalstar's unique spectrum location, the public's prior investment in devices, and existing IEEE 802.11 technology to generate enormous benefits for American consumers. With Globalstar's diligent development and management of its licensed spectrum, the deployment of

See, e.g., Qualcomm White Paper, VoLTE with SRVCC: The Second Phase of Voice Evolution for Mobile LTE Devices, at 1 (Oct. 31, 2012), available at: http://www.qualcomm.com/media/documents/srvcc-white-paper ("The 3GPP Long Term Evolution (LTE) high-speed, high-capacity data standard for mobile devices is well on its way to becoming a globally deployed standard. . . . It is clear that the majority of operators, both GSM and CDMA, will evolve their networks to LTE."); Interview of Kent German by Kara Tsuboi, CNET (Sept. 27, 2012), available at: http://cnettv.cnet.com/lte-expanding-across-carriers-world/9742-1_53-50132071.html (discussing how LTE is expanding to more cities, not only in the United States, but across the world, and is expected to become a global standard).

TLPS facilities should result in a highly productive and spectrally efficient use of the Upper Big LEO band during this interim period and beyond.

As described in the Technical Analysis in Appendix B to this Petition, the spectrum architecture for this Globalstar-controlled TLPS will be unique, made possible by the proximity of Globalstar's Upper Big LEO band to the ISM band below 2483.5 MHz.²¹ Specifically, this innovative low-power service will be provided over 22 megahertz of spectrum at 2473-2495 MHz, encompassing both Globalstar's exclusive terrestrial use spectrum at 2483.5-2495 MHz and adjacent unlicensed ISM spectrum at 2473-2483.5 MHz.²² This unique, hybrid spectrum approach will be consistent both with a new, more flexible regulatory framework for terrestrial operations in the Big LEO band,²³ and with existing Part 15 regulations for use of the ISM band.²⁴

Globalstar-managed TLPS operations at 2473-2495 MHz will be based on IEEE 802.11 technology. As described in the Technical Analysis, the IEEE 802.11 standard specifies fourteen

Technical Analysis Regarding Globalstar's Proposed Terrestrial Low-Power Service, John Dooley (Appendix B) at 3-4 ("Technical Analysis").

²² *Id.* at 3.

As discussed in detail *infra* at 38-41 and in the Technical Analysis attached as Appendix B, Globalstar-managed TLPS will require not only a more flexible regulatory framework for MSS-terrestrial operations in the Upper Big LEO band, but also an out-of-band emissions limit that accommodates the emissions mask for TLPS transmissions.

Any party can use the unlicensed ISM spectrum at 2473-2483.5 MHz as long as those operations do not cause interference to Globalstar's MSS operations above 2483.5 MHz. Globalstar-managed TLPS would co-exist with existing Bluetooth and other unlicensed uses of ISM spectrum without raising any harmful interference issues.

Globalstar's TLPS operations will not require a waiver or amendment of Section 15.249(d) of the Commission's rules, which states that "[e]missions radiated outside of the [2400-2483.5 MHz band], except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation." 47 C.F.R. § 15.249(d). Globalstar's TLPS operations at 2483.5-2495 MHz will be functional, licensed, *in-band* transmissions in Globalstar's own Big LEO spectrum, not spurious or out-of-band emissions. The Commission's Section 15.249(d) out-of-band emissions limit will therefore be inapplicable to these TLPS operations above 2483.5 MHz.